IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Hisashi Ohtani, et al
Serial No. : 08/690,747
Filed : August 1, 1996
Title : METHOD FOR MANUFACTURING SEMICONDUCTOR DEVICE

Art Unit : 1765
Examiner : Robert Kunemund

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REPLY TO ACTION OF JANUARY 7, 2004

In reply to the Office Action of January 7, 2004, Applicants submits the following remarks.

Applicants submit that the finality of this Office Action is in error. Applicants submitted a Request for Continued Examination on October 8, 2003 with an amendment that amended claims 21, 25, 37-39, and 49-54 and added claims 97-105. The Examiner has rejected claims 21, 25, 37-39, and 37-105 over Nakajima (U.S. Patent No. 5,712,191) in view of Yamada (JP5-109,737) and Hsu (U.S. Patent No. 5,712,203). The Hsu reference is new art cited for the first time by the Examiner in this Office Action. Accordingly, the finality of this Office Action is not proper pursuant to MPEP §706.07(b).

Claims 21, 25, and 37-105 are pending in this application, with claims 21, 25, 37-39, and 49-56 being independent.

Independent claims 21, 25, 37-39, and 49-56 have been rejected along with their dependent claims 40-48 and 57-96 as being unpatentable over Nakajima in view of Yamada and Hsu.

Claim 21 recites a method for manufacturing a semiconductor device including introducing an ion of an element which is inert into a selected portion of a semiconductor film "using a first mask covering a first portion of said semiconductor film provided over said semiconductor film ... forming a second mask over said semiconductor film; *and etching a part of said first portion of said semiconductor film and said selected portion* of said semiconductor film using said second mask after said heating to form an active layer of said semiconductor device" (emphasis added). As stated in the remarks in the amendment mailed on October 8,

2003, neither Nakajima, Yamada, nor any combination of the two describes or suggests the recited operations of introducing ions using a first mask, forming a second mask, and using the second mask to etch both the portion of the semiconductor film in which the ions were introduced (i.e., the selected portion) and a portion of the semiconductor film in which the ions were not introduced because the portion was covered by the first mask (i.e., part of the first portion).

Hsu does not remedy the deficiencies of Nakajima and Yamada. The Examiner cites Hsu as disclosing "the use of two masks in semiconductor manufacture to aid in etching, note col. 3." Applicants are unable to determine the two masks that the Examiner is referencing in Hsu as facilitating etching. Moreover, even assuming for sake of argument that Hsu discloses the use of two masks to facilitate etching, Hsu does not describe or suggest using two masks in the recited manner. In particular, Hsu does not describe or suggest introducing ions using a first mask, forming a second mask, and using the second mask to etch both the portion of the semiconductor film in which the ions were introduced and a portion of the semiconductor film in which the ions were not introduced because the portion was covered by the first mask.

For at least these reasons, no proper combination of Nakajima,Yamada, and Hsu describes or suggests the claimed combination of steps, and, accordingly, Applicants request withdrawal of the rejection of claim 21 and its dependent claims.

Claim 25, which also recites introducing ions of an inert element; claims 37-39, which recite introducing phosphorous; and claims 49 and 50, which recite introducing argon ions, recite the use of two masks in the same way as claim 21. Accordingly, applicants request withdrawal of the rejection of claims 25, 37-39, 49, 50 and their dependent claims, for at least the same reasons as those discussed above in reference to claim 21.

Claims 51 and 52 recite a method for manufacturing a semiconductor device including forming a semiconductor island, providing the semiconductor island with a crystallization promoting material, introducing an argon ion into a selected portion of the semiconductor island, heating the semiconductor island, and "*removing said selected portion of said semiconductor island and a part of said semiconductor island adjacent to said selected portion* in order to form

an active layer of said semiconductor device" (emphasis added). Applicants request reconsideration and withdrawal of the rejection of claims 51 and 52, and their dependent claims because neither Nakajima, Yamada, Hsu, nor any combination of the three describes or suggests the recited removing step for at least the same reasons as those discussed above in reference to claim 21.

Claims 53 and 54 recite a method for manufacturing a semiconductor device including forming a semiconductor film, providing the semiconductor film with a crystallization promoting material, introducing an argon ion into a selected portion of the semiconductor film using a mask provided over the semiconductor film, heating the semiconductor film, and "*etching said selected portion of said semiconductor film and a part of said semiconductor film covered with said mask* in said introducing step after said heating to form an active layer of the semiconductor device, wherein said part of said semiconductor film covered with said mask in said introducing step is adjacent to said selected portion" (emphasis added). Applicants request reconsideration and withdrawal of the rejection of claims 51 and 52, and their dependent claims, because neither Nakajima, Yamada, Hsu, nor any combination of the three describes or suggests the recited etching step for at least the same reasons as those discussed above in reference to claim 21.

Claims 55 and 56 recite a method for manufacturing a semiconductor device including introducing an argon ion into a selected portion of a semiconductor film "using a first mask covering a first portion of said semiconductor film provided over said semiconductor film ... forming a second mask over said semiconductor film; *and etching a part of said first portion of said semiconductor film and said selected portion* of said semiconductor film using said second mask after said heating to form an active layer of said semiconductor device" (emphasis added). Applicants request reconsideration and withdrawal of the rejection of claims 55 and 56, and their dependent claims, because neither Nakajima, Yamada, Hsu, nor any combination of the three describes or suggests the recited operations for at least the same reasons as those discussed above in reference to claim 21.

Dependent claims 97-105 have been rejected as being unpatentable over Nakajima in view of Yamada and Hsu. Dependent claims 97-105 depend from independent claims 21, 25,

37-39, 49, 50, 55, and 56 and, accordingly, are patentable over Nakajima, Yamada, Hsu, or any combination of the three for at least the reasons discussed above with respect to the independent claims.

Applicants submit that all claims are in condition for allowance.

Enclosed is a $110 check for the Petition for Extension of Time fee. Please apply any other charges or credits to deposit account 06-1050.

Respectfully submitted,

Date: 4/20/04

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